catalyst state estimation means for estimating a state of said catalyst at a time at which said index means has obtained the index value, as to a physical quantity which affects a catalytic action of said catalyst;

correction means for correcting said index value obtained by said index means, to a value in a standard state of said catalyst previously set as to the physical quantity, by the use of the estimated result of said catalyst state estimation means; and

decision means endowed with a preset criterion value, and for deciding said deterioration state of said catalyst by comparing the index value corrected by said correction means, with the criterion value, wherein:

said catalyst serves to eliminate noxious substances which are contained in exhaust gas of an engine; and

said catalyst state estimation means includes

operating-situation detection means for detecting a value of that state variable of the engine which correlates with said physical quantity;

memory means for storing therein correspondence information which indicate correlations between values of the state variable and those of said physical quantity; and

arithmetic means for determining a value of said physical quantity by referring to the correspondence information on the basis of the detected result of said operating-situation detection means.

7. (Amended) A catalyst-deterioration diagnostic system for diagnosing a deterioration state of a catalyst, comprising:

index means for obtaining a value of an index which is used for deciding the deterioration state of the catalyst;

decision means endowed with a preset criterion value, and for deciding said deterioration state of said catalyst by comparing the index value obtained by said index means, with the criterion value;

catalyst state estimation means for estimating a state of said catalyst at a time at which said index means has obtained said index value, as to a physical quantity which affects a catalytic action of said catalyst; and

suspension means endowed with a predetermined range concerning the physical quantity, and for causing said decision means to suspend the decision on condition that a value of said physical quantity obtained by said catalyst state estimation means is outside the predetermined range, wherein:

said catalyst serves to eliminate noxious substances which are contained in exhaust gas of an engine; and

said catalyst state estimation means includes

operating-situation detection means for detecting a value of that state variable of the engine which correlates with said physical quantity;

memory means for storing therein correspondence information which indicate correlations between values of the state variable and those of said physical quantity; and

arithmetic means for determining a value of said physical quantity by referring to the correspondence information on the basis of the detected result of said operating-situation detection means.

Add the following claims:

17. (New) A diagnostic system for diagnosing a deterioration state of a catalyst in an engine, comprising:

a memory for storing a preset criterion value and a predetermined range for a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst; and

a processor connected to the memory for obtaining an index value indicative of a conversion efficiency of the catalyst; receiving a value of the state variable of the engine; suspending a determination of the deterioration state of the catalyst if the value of the state variable is outside the predetermined range; and determining the deterioration state of the catalyst by comparing the index value with the preset criterion value if the value of the state variable is within the predetermined range.

18. (New) The diagnostic system of claim 17, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions-per-minute of the engine.

19. (New) The diagnostic system of claim 17, wherein the preset criterion value represents a limit of deterioration calling for replacement of the catalyst.

20. (New) A diagnostic system for diagnosing a deterioration state of a catalyst in an engine, comprising:

a memory for storing a preset criterion value; and

a processor connected to the memory for obtaining an index value indicative of a conversion efficiency of the catalyst; receiving a value of a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst; modifying the index value to a value in a standard state of the catalyst previously set as to the physical quantity using the value of the state variable; and determining the deterioration state of the catalyst by comparing the modified index value with the preset criterion value.

21. (New) The diagnostic system of claim 20, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions-per-minute of the engine.

22. (New) The diagnostic system of claim 20, wherein the preset criterion value represents a limit of deterioration calling for replacement of the catalyst.

23. (New) A method of diagnosing a deterioration state of a catalyst in an engine, comprising:

(a) storing a preset criterion value and a predetermined range for a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst;

(b) obtaining an index value indicative of a conversion efficiency of the catalyst;

(c) detecting a value of the state variable of the engine;

(d) suspending a determination of the deterioration state of the catalyst if the value of the state variable is outside the predetermined range; and

(e) determining the deterioration state of the catalyst by comparing the index value with the preset criterion value if the value of the state variable is within the predetermined range.

24. (New) The method of claim 23, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions-per-minute of the engine.

25. (New) The method of claim 23, wherein the present criterion value represents a limit of deterioration calling for replacement of the catalyst.

26. (New) A method of diagnosing a deterioration state of a catalyst in an engine, comprising:

(a) storing a preset criterion value;

(b) obtaining an index value indicative of a conversion efficiency of the catalyst;

(c) detecting a value of a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst;

(d) modifying the index value to a value in a standard state of the catalyst previously set as to the physical quantity using the value of the state variable; and

(e) determining the deterioration state of the catalyst by comparing the modified index value with the preset criterion value.

27. (New) The method of claim 26, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions per minute of the engine.

28. (New) The method of claim 26, wherein the present criterion value represents a limit of deterioration calling for replacement of the catalyst.

REMARKS

In view of the above amendments, obvious-type double patenting rejections of Claims 4, of Claims 4, 5, 8, 9 and 12, and of Claim 5 over certain claims of U.S. Patent Nos. 5,526,643 and 6,343,466, as well as the rejection of Claims 4, 5 and 8-16 under 35 USC § 101, are traversed and, in any event, are moot. Reconsideration of these rejections is requested, particularly as the above